

THE CLAIMS

WHAT IS CLAIMED:

1. A bone plate for fixation of proximal humerus fractures comprising:
an elongated shaft portion having a first width;
5 a head portion connected to the shaft portion and having a second width greater than the first width, the head portion and the shaft portion defining a common longitudinal axis;
at least one first screw hole located in the head portion;
at least one second screw hole located in the shaft portion;
10 wherein at least one of the first and second screw holes is configured to engage a head of a bone screw to form an angularly stable connection with the bone screw.
2. The bone plate of claim 1, wherein at least one of the first and second screw holes is at least partially threaded.
- 15 3. The bone plate of claim 2, wherein the thread has a pitch of about 0.5 mm to about 1.1 mm.
4. The bone plate of claim 3, wherein the thread has a pitch of about 0.7 mm to about 0.9 mm.
5. The bone plate of claim 2, wherein the thread is double threaded.
- 20 6. The bone plate of claim 1, wherein at least one of the first and second screw holes includes at least a partial peripheral groove for engaging a head of a bone screw.
7. The bone plate of claim 6, wherein the peripheral groove is substantially wedge shaped.
- 25 8. The bone plate of claim 1, wherein the bone plate has a thickness ranging from about 1.7 mm to about 2.3 mm.

9. The bone plate of claim 1, wherein the bone plate has a thickness ranging from about 1.9 mm to about 2.1 mm.
10. The bone plate of claim 1, wherein the head portion is connected to the shaft portion at a transition area having a third width that increases from the first width to the second width.
11. The bone plate of claim 10, wherein the third width widens exponentially.
12. The bone plate of claim 1, wherein at least a portion of the shaft portion is curved along the longitudinal axis.
13. The bone plate of claim 12, wherein the at least portion of the shaft portion is curved in the form of an elliptical arc.
14. The bone plate of claim 13, wherein the elliptical arc is defined by a portion of an ellipse having a major axis with a length in the range of between about 150 mm and about 170 mm.
15. The bone plate of claim 14, wherein the length of the major axis is in the range from about 157 mm to about 163 mm.
16. The bone plate of claim 13, wherein the elliptical arc is defined by a portion of an ellipse having a minor axis with a length in the range of between about 60 mm and about 80 mm.
17. The bone plate of claim 16, wherein the length of the minor axis is in the range of between about 67 mm and about 73 mm.
18. The bone plate of claim 1, wherein a distal end of the shaft portion lays in a first plane, and the head portion lays in a second plane that is substantially parallel to the first plane.
19. The bone plate of claim 1, wherein at least a portion of the bone plate has a curvature that runs transversely to the longitudinal axis.

20. The bone plate of claim 19, wherein the curvature has a radius of curvature in the range from about 18 mm to about 22 mm.

21. The bone plate of claim 19, wherein the curvature runs substantially over the entire length of the bone plate.

5 22. The bone plate of claim 1, further comprising an upper surface and a lower surface, wherein the longitudinal axis generally divides at least one of the upper and lower surfaces in half, and further wherein at least a first pair of the first holes is symmetrically disposed about the longitudinal axis, and at least a second pair of the first holes is asymmetrically disposed about the longitudinal axis.

10 23. The bone plate of claim 22, wherein the head portion is connected to the shaft portion at a transition portion, and the at least one first pair of first holes is located farther from the transition portion than is the at least one second pair of the first holes.

24. The bone plate of claim 1, wherein at least one of the second holes defines a central axis that is substantially perpendicular to the longitudinal axis.

15 25. A bone plate for fixation of a fractured bone, the bone plate comprising:

an elongated shaft portion and a widened head portion, the shaft portion and the head portion defining a common longitudinal axis extending substantially centrally along the bone plate;

20 a first pair of screw holes located in the head portion, the first pair of holes include a first hole having a first central axis and a second hole having a second central axis, wherein the first and second holes are asymmetrically disposed about the longitudinal axis;

a second pair of screw holes located in the head portion, the second pair of holes include a third hole having a third central axis and a fourth hole having a fourth central axis, wherein the third and fourth holes are symmetrically disposed about the longitudinal axis;

25 wherein the first central axis lies in a first plane and the second central axis lies in a second plane that is substantially parallel to the first plane, further
30 wherein when the first central axis and the second central axis are projected onto a third

plane substantially orthogonal to the longitudinal axis, the first central axis and the second central axis intersect to form an acute angle.

26. The bone plate of claim 25, wherein the acute angle is between about 50° and about 60°.

5 27. The bone plate of claim 26, wherein the acute angle is between about 46° and about 54°.

28. The bone plate of claim 25, wherein the third and fourth central axes are substantially parallel to one another.

10 29. The bone plate of claim 25, wherein the bone plate includes an upper surface and a lower surface, and at least one of the third and fourth central axis forms an obtuse angle with respect to the lower surface.

30. The bone plate of claim 29, wherein the obtuse angle ranges between about 92° and about 98°.

15 31. The bone plate of claim 30, wherein the obtuse angle ranges between about 94° and about 96°.

32. The bone plate of claim 25, wherein at least one of the first, second, third and fourth screw holes includes a threading to engage a head of a bone screw.

33. The bone plate of claim 32, wherein the threading has a pitch of between about 0.5 mm and about 1.1 mm.

20 34. The bone plate of claim 32, wherein the threading is a double thread.

35. The bone plate of claim 25, wherein the bone plate has a thickness ranging from about 1.7 mm to about 2.3 mm.

36. The bone plate of claim 25, wherein at least a portion of the shaft portion is curved along the longitudinal axis in the form of an elliptical arc.

37. The bone plate of claim 36, wherein the elliptical arc is defined by a portion of an ellipse having a major axis with a length in the range of between about 150 mm and about 170 mm and a minor axis with a length in the range of between about 60 mm and about 80 mm.

5 38. The bone plate of claim 25, wherein at least a portion of the bone plate has a curvature that runs transversely to the longitudinal axis, the curvature having a radius of curvature in the range from about 18 mm to about 22 mm.

10 39. The bone plate of claim 25, wherein the head portion and the shaft portion are shaped and dimensioned to substantially match a proximal humerus.